

नेपाल सरकार
गृह मन्त्रालय
प्रहरी प्रधान कार्यालय
(मानवश्रोत एवं प्रशासन विभाग, भर्ना तथा छनौट महाशाखा)
नक्साल, काठमाण्डौं ।

प्राविधिक प्रहरी निरीक्षक (सूचना प्रविधि/कम्प्युटर) पदको खुला प्रतियोगात्मक परीक्षाको पाठ्यक्रम ।

पाठ्यक्रमको रूपरेखा:- यस पाठ्यक्रमको आधारमा निम्नानुसार तिन चरणमा परीक्षा लिईने छ :-

प्रथम चरण:- लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

द्वितीय चरण:- प्रयोगात्मक (Practical)

पूर्णाङ्क :- ५०

तृतीय चरण:- अन्तरवार्ता (Interview)

पूर्णाङ्क :- ३०

प्रथम चरण:- लिखित परीक्षा योजना (Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उत्तीणाङ्क	परीक्षा प्रणाली	प्रश्न संख्या X अङ्कभार	समय
प्रथम	कम्प्युटर	१००	४०	वस्तुगत बहुउत्तर (Objective)	१००×१=१००	१ घण्टा १५ मिनेट
द्वितीय	सम्बन्धी विषय	५०	२०	विषयगत (Subjective)	५×१०=५०	१ घण्टा ५० मिनेट
तृतीय	नेपाल प्रहरी सेवा सम्बन्धी	५०	२०	वस्तुगत बहुउत्तर	१०×१ = १०	१ घण्टा १० मिनेट
				विषयगत	लामो उत्तर १×१० = १० छोटो उत्तर ६×५ = ३०	

द्वितीय चरण	प्रयोगात्मक परीक्षा	५०	२५	प्रयोगात्मक	५×१०=५०	१ घण्टा ३० मिनेट
तृतीय चरण	अन्तर्वार्ता	३०	-	मौखिक	-	-

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- पाठ्यक्रमको प्रथम र द्वितीय पत्र तथा प्रयोगात्मक परीक्षाको विषयवस्तु एउटै हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षा तथा प्रयोगात्मक परीक्षाका प्रश्नसंख्या निम्नानुसार हुनेछन् :-

प्रथम पत्रका एकाई	1	2	3	4	5	6	7	8	9	10	11	12
प्रश्न संख्या	10	8	10	8	8	8	8	8	8	8	8	8
द्वितीय पत्रका खण्ड	A				B		C			D		
द्वितीय पत्रका एकाई	2	5	4		6	7	8			1		
प्रश्न संख्या	1		1		1		1			1		
प्रयोगात्मक परीक्षाको एकाई	1	2	3	4	5	6	7	8	9	10	11	12
प्रश्न संख्या	1	-	1	1	-	-	1	1	-	-	-	-

५. प्रथम पत्रमा वस्तुगत बहुउत्तर (Multiple Choice) प्रश्नहरूको उत्तर सही दिएमा प्रत्येक सही उत्तर बापत १ (एक) अङ्क प्रदान गरिनेछ भने गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अर्थात ०.२ अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
६. द्वितीय पत्रको विषयगत प्रश्नका लागि तोकिएका १० अङ्कका प्रश्नहरूको हकमा १० अङ्कको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes)सोधन सकिने छ ।
७. द्वितीय पत्रको पाठ्यक्रमलाई ४ वटा खण्ड/एकाईमा विभाजन गरिएको छ । ४ वटा खण्ड/एकाईको लागि ४ वटै उत्तरपुस्तिका दिइनेछ र परिक्षार्थीले प्रत्येक खण्ड/एकाईका प्रश्नहरूको उत्तर सोही खण्ड/एकाईको उत्तर पुस्तिकामा लेख्नु पर्नेछ ।
८. यस पाठ्यक्रममा जेसुकै लेखिएको भएता पनि पाठ्यक्रममा परेका ऐन, नियमहरू परीक्षाको मिति भन्दा ३(तीन) महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा रहेको सम्झनु पर्दछ ।
९. प्रथम चरणको लिखित परीक्षाबाट छुनौट भएको उम्मेदवारहरूलाई मात्र द्वितीय चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ
१०. यस भन्दा अगाडि लागू भएका माथि उल्लिखित समूहको पाठ्यक्रम खारेज गरिएको छ ।
११. पाठ्यक्रम लागू मिति: २०७४-०४-२३ गते ।

कम्प्युटर सम्बन्धी विषय

1. Computer Networks

- 1.1 Protocol stack, switching
- 1.2 Link Layer: services, error detection and correction, multiple access protocols, LAN addressing and ARP (Address Resolution Protocol), Ethernet, CSMA/CD multiple access protocol, Hubs, Bridges, and Switches, Wireless LANs, PPP (Point to Point Protocol), Wide area protocols
- 1.3 Network Layer: services, datagram and virtual circuits, routing principles and algorithms, Internet Protocol (IP), IP addressing, IP transport, fragmentation and assembly, ICMP (Internet Control Message Protocol), routing on the internet, RIP (Routing Information Protocol), OSPF (Open Shortest Path First), router internals, IPv6
- 1.4 Transport Layer: principles, multiplexing and de-multiplexing, UDP, TCP, flow control, principles of congestion control, TCP congestion control
- 1.5 Application Layer: Web and Web caching, FTP (File Transfer Protocol), Electronic mail, DNS (Domain Name Service), socket programming
- 1.6 Distributed system, Clusters

2. Computer Architecture & organization and micro-processors

- 2.1 Basic Structures: sequential circuits, design procedure, state table and state diagram, von Neumann / Harvard architecture, RISC/CISC architecture
- 2.2 Addressing Methods and Programs, representation of data, arithmetic operations, basic operational concepts, bus structures, instruction, cycle and excitation cycle.
- 2.3 Processing Unit: instruction formats, arithmetic and logical instruction.
- 2.4 Addressing modes
- 2.5 Input Output Organization: I/O programming , memory mapped I/O, basic interrupt system, DMA
- 2.6 Arithmetic
- 2.7 Memory Systems
- 2.8 808X and Intel microprocessors: programming and interfacing

3. Basic Electronics and Digital Design

3.1 Basic Electronics

- 3.1.1 Semiconductors, Diodes and Diode Circuits, Transistors,
- 3.1.2 Transistor modeling
- 3.1.3 Biasing and Amplification
- 3.1.4 Small Signal amplifiers and frequency response
- 3.1.5 Large signal amplifiers, feedback amplifiers and Oscillators
- 3.1.6 Operational amplifiers

3.2 Digital Design

- 3.2.1 Digital and Analog Systems. Number Systems.
- 3.2.2 Logic Elements
- 3.2.3 Combinational Logic Circuits
- 3.2.4 Sequential Logic
- 3.2.5 Arithmetic Circuits
- 3.2.6 MSI Logic circuits
- 3.2.7 Counters and Registers
- 3.2.8 IC logic families
- 3.2.9 Interfacing with Analog Devices
- 3.2.10 Memory Devices

- 4. Structured and object oriented programming**
 - 4.1 Data types, ADT
 - 4.2 Operators, variables and assignments, control structures
 - 4.3 Procedure/function
 - 4.4 Class definitions, encapsulation, inheritance, object composition, Polymorphism
 - 4.5 Pattern and framework

- 5. Data structures**
 - 5.1 General concepts : Abstract data Type, Time and space analysis of algorithms, Big oh and theta notations, Average, best and worst case analysis
 - 5.2 Linear data structures
 - 5.3 Trees: General and binary trees, Representations and traversals, Binary search trees, balancing trees, AVL trees, 2-3 trees, red-black trees, self-adjusting trees, Splay Trees
 - 5.4 Algorithm design techniques: Greedy methods, Priority queue search, Exhaustive search, Divide and conquer, Dynamic programming, Recursion
 - 5.5 Hashing
 - 5.6 Graphs and digraphs
 - 5.7 Sorting

- 6. Software Engineering principles(System analysis & design)**
 - 6.1 Software process: The software lifecycle models, risk-driven approaches
 - 6.2 Software Project management: Relationship to lifecycle, project planning, project control, project organization, risk management, cost models, configuration management, version control, quality assurance, metrics
 - 6.3 Software requirements: Requirements analysis, requirements solicitation, analysis tools, requirements definition, requirements specification, static and dynamic specifications, requirements review.
 - 6.4 Software design: Design for reuse, design for change, design notations, design evaluation and validation
 - 6.5 Implementation: Programming standards and procedures, modularity, data abstraction, static analysis, unit testing, integration testing, regression testing, tools for testing, fault tolerance
 - 6.6 Maintenance: The maintenance problem, the nature of maintenance, planning for maintenance
 - 6.7 SE issues: Formal methods, tools and environments for software engineering, role of programming paradigm, process maturity and Improvement, ISO standards, SEI-CMM, CASE tools

- 7. Database Management System**
 - 7.1 Introduction : The relational model, ER model , SQL, Functional dependency and relational database design, File structure
 - 7.2 Transaction Management and Concurrency Control: Concurrent execution of the user programs, transactions, Concurrency control techniques
 - 7.3 Crash Recovery : types of failure, Recovery techniques
 - 7.4 Query Processing and Optimization
 - 7.5 Indexing : Hash based indexing, Tree based indexing
 - 7.6 Distributed Database Systems and Object oriented database system
 - 7.7 Data Mining and Data Warehousing
 - 7.8 Security Management System

- 8. Operating System**
 - 8.1 Processes and Threads: Symmetric Multiprocessing, Micro-kernels, Concurrency, Mutual Exclusion and Synchronization, Deadlock.
 - 8.2 Scheduling

- 8.3 Memory Management
- 8.4 Input Output and Files: I/O devices and its organization, Principles of I/O software and hardware, Disks, Files and directories organization, File System Implementation.
- 8.5 Distributed Systems: Distributed Message passing, RPC, Client/Server Computing, Clusters.
- 8.6 Security : Authentication and Access Authorization, System Flaws and Attacks, Trusted system

9. Compiler design

- 9.1 The Structure of a Compiler
- 9.2 Lexical Analyzer
- 9.3 Top down Parsing/ Bottom up Parsing
- 9.4 Syntax Directed Translation
- 9.5 Types and Type Checking
- 9.6 Run-Time Storage Administration
- 9.7 Intermediate Code generation
- 9.8 Data-Flow Analysis and Code Optimizations
- 9.9 Architecture and recent development on compilers

10. Computer Graphics

- 10.1 Graphics concepts
- 10.2 Input devices and techniques
- 10.3 Basic raster graphics algorithms and primitives
- 10.4 Scan conversion
- 10.5 Graphics hardware
- 10.6 2D geometrical transformations and viewing
- 10.7 3D geometry and viewing
- 10.8 Hierarchical modeling
- 10.9 Projections
- 10.10 Hidden surface removal
- 10.11 Shading and rendering

11. Emerging Technology and Electives

- 11.1 Modeling and simulation
- 11.2 Parallel and distributed computing
- 11.3 High speed networks
- 11.4 Artificial Neural Network and Computer Vision
- 11.5 Adaptive web technology
- 11.6 Software Architecture
- 11.7 Distributed Object technology (ORB, DCOM)
- 11.8 Speech signal processing
- 11.9 Cryptography and network security
- 11.10 E-commerce
- 11.11 Software project management
- 11.12 Embedded systems
- 11.13 Image processing
- 11.14 Multimedia
- 11.15 Expert system
- 11.16 GIS/ Remote sensing/ GPS

12. Wireless Communications

- 12.1 Radio frequency band
- 12.2 Propagation theory (groundwave, spacewave, tropospheric, ionospheric)
- 12.3 Mobile Technologies (DECT, GSM, CDMA2000-1x and etc.)

- 12.4 Fundamental of satellite communication (tracking, Satellite orbits and Radio spectrum, satellite wave propagation and satellite antennas)
- 12.5 Digital satellite communication system
- 12.6 Earth stations
- 12.7 Kepler's laws of orbital motion
- 12.8 Signal to noise ratio
- 12.9 Interference between different wireless systems
- 12.10 Antennas (Directional, Non-directional, reflective)
- 12.11 Impedance and effective length of antenna as transmitter & receiver
- 12.12 Radiation pattern
- 12.13 Broad-side pattern

-समाप्त-

स्वातंत्र्य प्रहार